

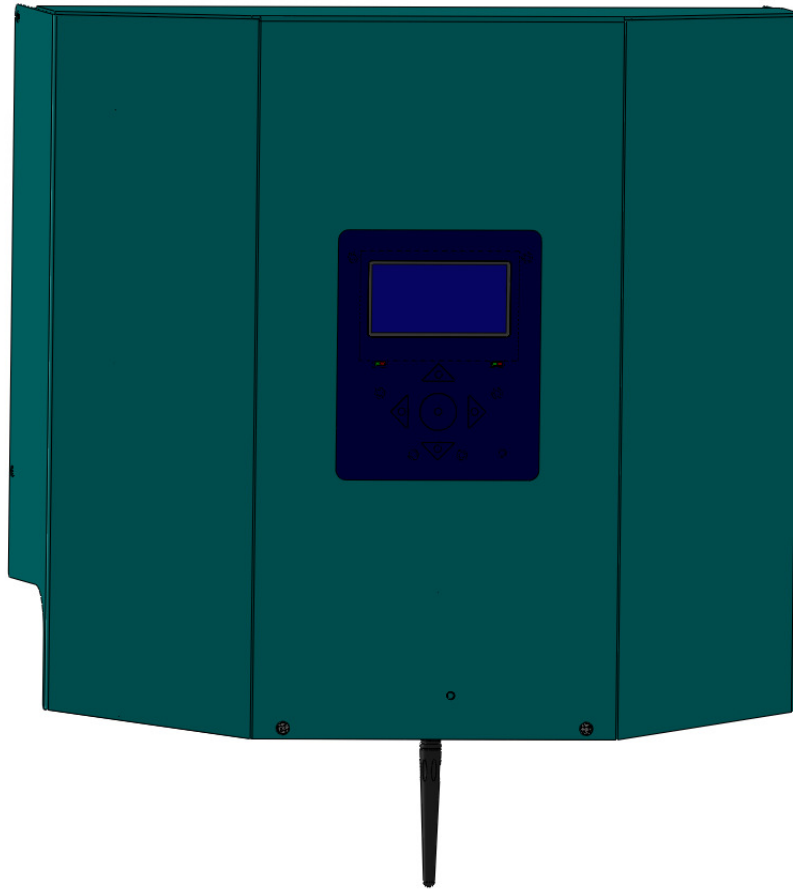


# Pika X3001 Inverter Installation & Service Manual

[pika-energy.com](http://pika-energy.com)



# Installation & Service Manual for the X3001 REbus™ Inverter



## Revision Table

Revision	Date	Changes
1.0	2012-06-27	Initial Release
1.1	2012-09-17	Changes from UL1741 and CSA review
1.2	2012-11-10	Changes for Intertek listing report
1.3	2014-01-01	Updates for Gamma build
1.4	2014-10-24	REbus wiring conventions & additional troubleshooting steps

## General Remarks

**Congratulations!** You have purchased the Pika Energy X3001 REbus™ bidirectional DC/AC inverter, a dependable, efficient component of your clean energy system. The X3001 is the result of the Pika team's careful development and testing, building on decades of experience in the fields of power electronics and renewable energy systems.

The X3001 is an electrically non-isolated single-stage inverter designed for high-efficiency bidirectional conversion between a REbus™ Microgrid and 220-240 VAC 60 Hz split-phase utility service. This inverter is passively cooled for high reliability and low noise. A replaceable capacitor bank ensures that even in the unusual event of capacitor failure, an easy remedy is available. An illuminated display and intuitive system of menus enable you to display the energy output of every component of your renewable energy system, including the energy exported by the inverter to the grid. The inverter also serves as an information gateway, enabling monitoring and control of your entire renewable energy system.

Unlike conventional inverters, which only connect to one type of energy source, Pika's X3001 is designed to operate as the hub for an expandable network of renewable energy devices, based on the REbus™ renewable energy standard.

### What is REbus™?

The underlying technology behind Pika Energy's X3001 Inverter is an innovative energy management technology or 'smart microgrid' called REbus™. REbus™ is a DC energy network that operates alongside the existing AC infrastructure, enabling customers to build cost-effective, scalable renewable energy systems. The REbus™ network is designed to serve as an open interconnection standard for networking next-generation energy technology – like Wi-Fi or USB for green energy!

**IMPORTANT!** Only REbus™ compatible components may be used in connection with this inverter. Do not connect the output of a PV array or any other non-REbus™ electrical source to the inverter terminals. Serious property damage and/or personal injury may result.

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## 1 Regarding this Document

This manual contains important instructions for the X3001 Inverter that must be followed during installation and maintenance of the inverter. The X3001 is designed and tested according to international safety requirements, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the X3001. To reduce the risk of personal injury and to ensure the safe installation and operation of the X3001, you must carefully read and follow all instructions, cautions and warnings in this user manual.

Store this manual so that it is always easily accessible.

### 1.1 Symbols used in this document



**WARNING:** This indicates a fact or feature very important for the safety of the user to prevent injury or death and/or which can cause serious hardware damage if not applied appropriately.



**CAUTION:** Presents information to prevent damage to this product



**EARTH GROUND SYMBOL**

### 1.2 Standards

The Pika X3001 Bidirectional REbus™ Inverter is certified by Intertek to be compliant with the UL 1741/IEEE 1547 standards as they apply to utility-interactive inverters.

### 1.3 Data Label

A permanently affixed label indicating the device specifications, serial number, and manufacturing date is located on the bottom surface of the inverter enclosure. Tampering with label can void warranty.

## 2 Important safety information and instructions

# IMPORTANT SAFETY INSTRUCTIONS

## SAVE THESE INSTRUCTIONS

This manual contains important instructions for model X3001 that shall be followed during installation and maintenance of the Pika X3001 Inverter.



**WARNING:** Before installing the Pika Energy X3001 Inverter, read all instructions and caution markings in this manual and on the X3001 as well as on other REbus™ devices.



**WARNING:** Electrical installation in the United States shall be done in accordance with all local electrical codes and/or the National Electrical Code (NEC), ANSI/NFPA 70.



**WARNING:** Electrical installation in Canada shall be done in accordance with all local electrical codes and/or the Canadian Electrical Code.



**WARNING:** Connecting the X3001 to the electric utility grid must only be done after receiving prior approval from the utility company and installation completed only by qualified personnel/licensed electrician(s).

### 2.1 Appropriate Usage

The X3001 is an electrically non-isolated single-stage inverter designed for high-efficiency bidirectional conversion between a REbus™ microgrid and a 220-240 VAC split-phase utility. Refer to this inverter installation manual for detailed information about the product and its intended use. The inverter may only be operated with REbus™ devices. Do not use the inverter for purposes other than those described here. Alternative uses, modifications to the inverter or the installation of components not expressly recommended or sold by the manufacturer void the warranty claims and operating permission. Contact the Pika Energy technical support if you need clarification regarding proper use of the inverter.

### 2.2 AC Output Details

The X3001 is to be connected to a split-phase 220-240VAC utility only. This means 120VAC from line to neutral and 240VAC from line to line. The AC neutral is not bonded to ground in the inverter. It is the responsibility of the installer to bond neutral to ground externally. The input and output circuits are isolated from the enclosure. System grounding to the ground lugs provided in the wiring box is the responsibility of the installer.

## 3 Notes concerning installation and operation

### 3.1 Intended (normal) use

Your inverter is strictly constructed according to approved safety requirements. Improper use may lead to lethal hazards for operators and/or damage to devices and property. The X3001 is certified to comply with the UL 1741 standard for utility-interactive devices, and includes important safety features including ‘anti-islanding’, which shuts down the inverter in the event of a grid power failure to avoid back-feeding power during a grid outage, which could result in injury to utility repair personnel. Improper use or modification of the X3001 may result in serious property damage, personal injury or death.

REBUS™ INPUT ONLY! The X3001 is designed to accept regulated direct current (DC) from REbus™-compatible devices (e.g. REbus™-compatible wind turbine, REbus™-compatible PV Link unit) into grid-compatible alternating current (AC). DO NOT CONNECT PHOTOVOLTAIC MODULES DIRECTLY TO THE REBUS™ INPUTS OF THE X3001 INVERTER. DOING SO WILL VOID THE WARRANTY AND MAY DAMAGE THE INVERTER.

The X3001 is typically operated in conjunction with a fixed connection to the utility grid, however it may be operated in conjunction with an approved standalone inverter as listed in the [X3001 AC Coupling Application Note](#), available by contacting Pika Technical Service. This unit is provided with fixed trip limits and shall not be aggregated above 30 kW on a single Point of Common Connection.

Any use other than the specified intended use shall not be deemed intended or normal use, and may result in property damage, personal injury or death. Pika is not liable for damage or injuries caused by unintended use.

Damage caused by unintended use is at the sole risk of the operator.

“Intended use” shall also include adherence to the operating and installation instructions.

Your trained and authorized installer must obtain all necessary permits and agreements from your local government and your utility company for a legal and code-compliant installation of your REbus™ Smart Microgrid system. See the User Manual for more detail.

### 3.2 Pika Energy Factory Limited Warranty

Pika Energy LLC (“Pika”) has developed a reliable, efficient inverter, designated X3001 (“Inverter”), that is designed to withstand normal operating conditions when used in accordance with its intended use and in compliance with instructions in the accompanying Installation Manual and User Manual shipped with the unit. The Pika limited warranty (“Limited Warranty”) covers defects in workmanship and materials of the Pika Inverter (“Defective Product”) for a period of five (5) years from the date of original purchase of such Inverter at point of sale to the originally-installed end user location (the “Warranty Period”). During the Warranty Period, the warranty is transferable to a different owner as long as the Inverter remains installed at the originally-installed end user location.

During the Warranty Period, if Pika determines through inspection the existence of a defect that is covered by the Limited Warranty, Pika will at its option, either (1) repair or replace the Defective Product free of charge, or (2) provide a credit or refund to the owner of the system at the originally installed end user location in an amount not to exceed the then-current price of (a) a “like kind” inverter that is available for purchase by the system owner at the time of the Limited Warranty claim, or (b) the original cost of the Pika Inverter that is subject to a Limited Warranty claim.

If Pika elects to repair or replace the Defective Product, Pika will, at its option, use new and/or reconditioned parts in repairing or replacing the Defective Product. Pika reserves the right to use parts or products of original or improved design in the repair or replacement of Defective Product. If Pika repairs or replaces a Defective Product, the Limited Warranty continues on the repaired or replacement product for the remainder of the original Warranty Period or ninety (90) days from the date of Pika’s return shipment of the repaired or replacement product, whichever is later. The Limited Warranty covers both parts and labor necessary to repair the Defective Product (if Pika elects to repair the Defective Product), but does not include labor costs related to (i) un-installing the Defective Product or (ii) if applicable, re-installing a repaired or replacement product. To the extent applicable, the Limited Warranty also covers the costs of shipping a repaired or replacement product from Pika, via a non-expedited freight carrier selected by Pika, to locations within the United States (including Alaska and Hawaii) and Canada, but not to other locations outside the United States or Canada. The Limited Warranty does not cover, and Pika will not be responsible for, shipping damage or damage caused by mishandling by the freight carrier and any such damage is the responsibility of the freight carrier.

To obtain repair or replacement service, credit or refund (as applicable) under this Limited Warranty, the customer must comply with the following policy and procedure:

- Many problems can be addressed in the field. Prior to returning a product, customer must contact Pika technical support to evaluate and troubleshoot the problem in the original installation setting.
- All Defective Product must be returned with a Return Merchandise Authorization Number (RMA) which customer must request from Pika.
- Requests for RMA must include the following information:
  - Proof-of-purchase of the Defective Product in the form of (1) the dated purchase receipt from the original purchase of the product at point of sale to the end user, or (2) the dated dealer invoice or purchase receipt showing original equipment manufacturer (OEM) status, or (3) the dated invoice or purchase receipt showing the product exchanged under warranty
  - Model number of the Defective Product
  - Serial number of the Defective Product
  - Detailed description of the defect.
  - Shipping address for return of the repaired or replacement product (as applicable).
- All Defective Product authorized for return must be returned in the original shipping container or other packaging that is equally protective of the product.
- The returned Defective Product must not have been disassembled or modified without the prior written authorization of Pika.

Pika Inverters are designed to withstand normal operating conditions and typical wear and tear when used for their original intent and in compliance with the installation and operating instructions supplied with the original equipment. The Limited Warranty does not apply to, and Pika will not be responsible



for, any defect in or damage to any Pika inverter: (1) that has been misused, neglected, tampered with, altered, or otherwise damaged, either internally or externally; (2) that has been improperly installed, operated, handled or used, including use under conditions for which the product was not designed, use in an unsuitable environment, or use in a manner contrary to the Pika User Manual or applicable laws or regulations; (3) that has been subjected to fire, water, generalized corrosion, biological infestations, acts of God, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the Pika Inverter specifications, including high input voltage from generators or lightning strikes; (4) that has been subjected to incidental or consequential damage caused by defects of other components of the system; or (5) if the original identification markings (including trademark or serial number) of such Inverter have been defaced, altered, or removed. The Limited Warranty does not cover costs related to the removal, installation or troubleshooting of the customer's electrical systems. The Limited Warranty does not extend beyond the original cost of the Pika Inverter.

THE LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY PIKA AND, WHERE PERMITTED BY LAW, IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF TITLE, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT OR WARRANTIES AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL OR OTHER INFORMATION PROVIDED IN MANUALS OR OTHER DOCUMENTATION. IN NO EVENT WILL PIKA BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, COSTS OR EXPENSES HOWEVER ARISING, WHETHER IN CONTRACT OR TORT, INCLUDING WITHOUT LIMITATION ANY ECONOMIC LOSSES OF ANY KIND, ANY LOSS OR DAMAGE TO PROPERTY, OR ANY PERSONAL INJURY.

To the extent any implied warranties are required under applicable law to apply to the Pika Inverter, such implied warranties shall be limited in duration to the Warranty Period, to the extent permitted by applicable law. Some states and provinces do not allow limitations or exclusions on implied warranties or on the duration of an implied warranty or on the limitation or exclusion of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply. This Limited Warranty gives the customer specific legal rights, and the customer may have other rights that may vary from state to state or province to province.

### 3.3 Service



**WARNING:** Do not attempt to repair the X3001 Inverter. The inverter contains no user-serviceable parts.

If the Pika X3001 Inverter fails, first contact Pika customer service at (207) 887-9105 for troubleshooting help. See the Warranty section for details on terms and conditions for repair or replacement under warranty. You must obtain an RMA (Returned Merchandise Authorization) number prior to returning the unit. Obtain the assistance of a skilled and qualified installer to safely disconnect the inverter for shipment.

#### Technical Support Information:

- Support department hours: 9AM to 5PM, Monday – Friday (excluding holidays)
- Phone: (207) 887-9105
- Email: [support@pika-energy.com](mailto:support@pika-energy.com)

## **4 The REbus™ Microgrid**

The REbus™ Microgrid is the underlying technology that allows for the efficient and robust interconnection of different types of renewable energy products and loads. This section is informational only and not required knowledge for operation of your Pika X3001 Inverter.

### **4.1 Simple and efficient power distribution**

The REbus™ Microgrid architecture was designed with renewable energy in mind. A clean-sheet approach to power distribution resulted in the most practical and efficient interconnection technology available. The microgrid operates at variable voltage in a defined band, between +/- 180-200 V relative to ground which simultaneously allows for efficient power transmission, reduced shock hazard, and simplified electronics for a bidirectional utility grid converter such as the X3001. The variable voltage communicates energy availability to the attached REbus™ devices, which allows for prioritized energy storage and load shedding. The microgrid is designed to support many different types of renewable energy sources and power converters, as well as accommodating future DC loads that are presently in development.

### **4.2 Integrated Power Line Carrier (PLC) communications**

The REbus™ microgrid standard also specifies an optional power line carrier communication technology that enables devices on the same microgrid to communicate with one another. The X3001 uses this capability to gather information about your system such as the status and energy production of your Pika T701 Wind Turbine or your solar array, which connects to the REbus™ microgrid through the Pika S2001 PV Link.

### **4.3 REbus™ Control Protocol (RCP)**

REbus™ Control Protocol is a communications protocol developed specifically for the transfer of data between REbus™-compatible power converters and data management products. RCP is an open-standard protocol which enables independent developers to interface with REbus™ products and create software and applications to enhance user experience. Please visit the Pika Energy website to learn more about RCP and the software applications that are currently available.

## 5 Designing a REbus™ system

Your trained and qualified installer will work with the Pika Energy technical support team to design the right system for your site. Please consult with Pika Energy sales department at (207) 887-9105 or on the web at <http://www.pika-energy.com> to find an installer near you.

The Pika Energy product system is designed from the ground up for unmatched flexibility. First and foremost, the X3001 Inverter accepts input from any combination of REbus™-compatible sources. In fact, the X3001 Inverter supports up to 32 devices on the REbus™ microgrid network, and the automatic power management capability of REbus™ allows the total power rating of sources on the network to exceed the inverter power rating by up to 2X. As of publication, Pika Energy offers the following REbus™ products in addition to the X3001 Inverter:

- T701 Wind Turbine
- S2001 PV Link
- B801 Battery Charge Controller
- REport Data Monitor

Check the Pika Energy website at <http://www.pika-energy.com> for the latest selection of REbus™-compatible product offerings.

## 6 Installation

### 6.1 Checking for shipping damage

The X3001 Inverter is thoroughly checked and tested before it is shipped. The inverters can be damaged in shipping, despite the carefully designed cardboard packaging.

Please inspect the inverter thoroughly after it is delivered. If any damage is seen please immediately notify the shipping company. If there is any question about potential shipping damage, contact Pika Energy. Please capture a photograph of the damage if possible.

Do not accept unit if visibly damaged or note visible damage when signing shipping company receipt. Report damage immediately to the shipping company. Do not remove the unit from its packaging. If it is determined that the unit must be returned, a RMA# must be obtained from Pika Energy.

### 6.2 Inverter mounting

The X3001 Inverter is a powder-coated steel enclosure (see Figure 1 for dimensions). The inverter is shipped complete and does not require a separate mounting bracket. A wall mounting bracket to permit mounting on a narrow structural member (e.g. stud) may be available, contact Pika Energy for details.

- For the longest possible life, the X3001 should be mounted out of direct rain, either under a weather proof overhang or indoors.
- The inverter should be restricted from direct sun exposure by mounting on the North side of a building or structure, indoors, or behind a sun shield. This will best prevent power derating due to inverter heatsink temperatures above 50 C. The maximum ambient temperature is 60 C. See Operations manual for additional details.
- If feasible, the inverter should be installed away from areas where animals congregate, as the high frequency (33 kHz) switching of the electronics may disturb them.
- During operation, the inverter heatsink may be hot and should be situated in locations where it will not be subject to incidental contact.
- Installation in close proximity to the AC distribution panel may eliminate the need for a supplemental AC service disconnect. Consult local inspectors or the NEC for details.
- The passive cooling system in the Pika X3001 will work best when the inverter is mounted on a flat, smooth, vertical wall.
- Minimum clearances must be maintained, as shown in Figure 2 below.

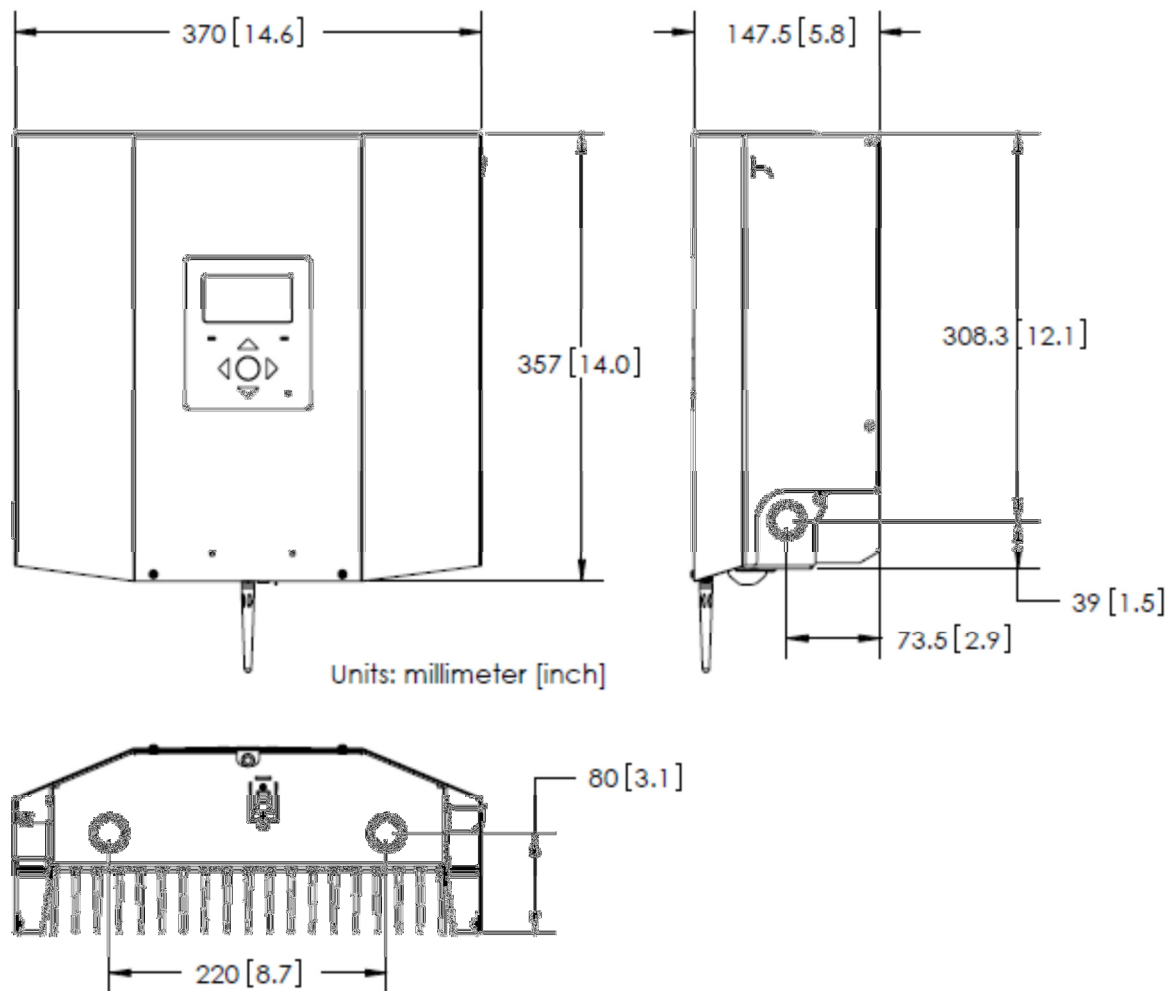


Figure 1 Pika X3001 Dimensions

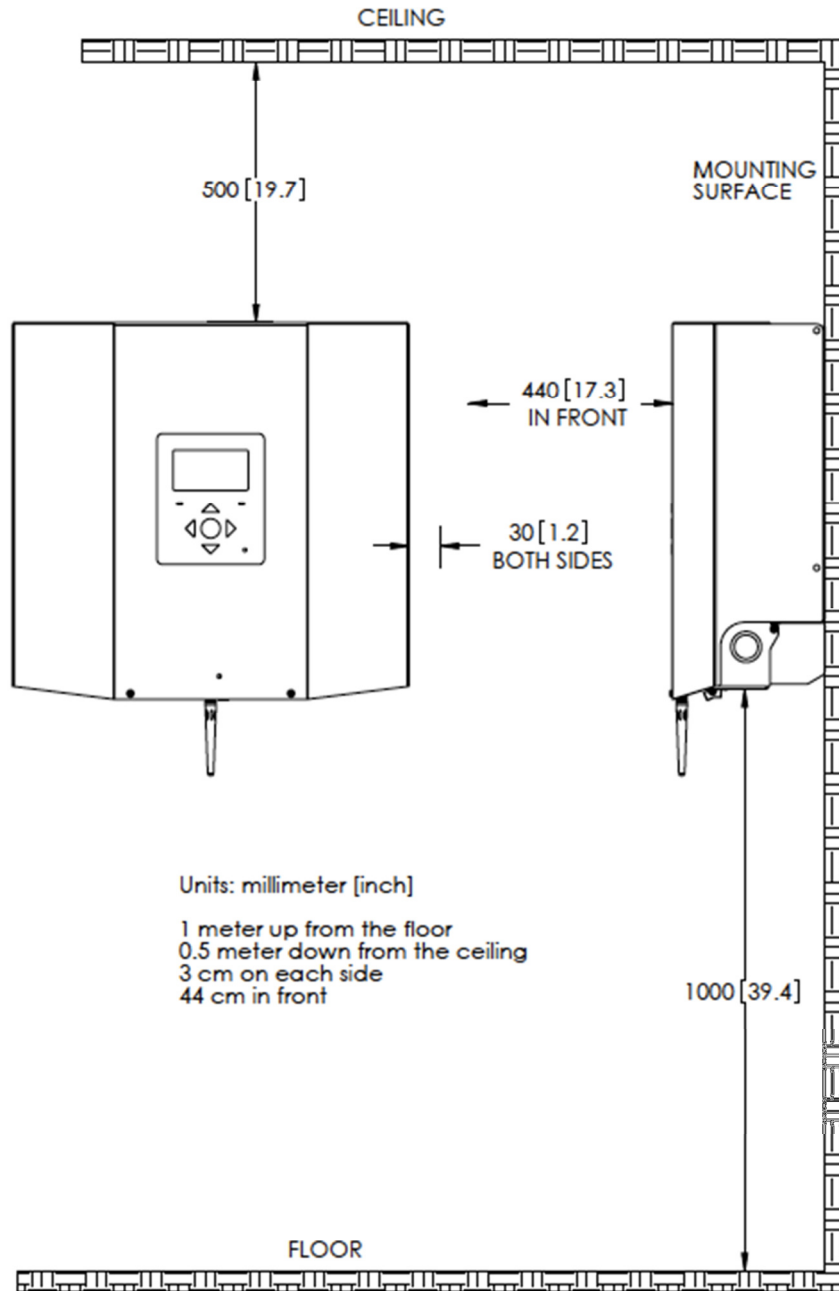


Figure 2 Inverter Minimum Clearance

Mounting surface must be suitable for installing #10 (~M5) pan head screws (suitable for tightening with screwdriver). These screws can be installed in wood, metal, or masonry. If screw anchors are used (e.g. concrete expansion anchor), they must be rated to hold the 11 kg (25 lb) inverter with appropriate safety factor. Drywall is not a recommended mounting surface for the inverter. Mounting surface should be vertical.

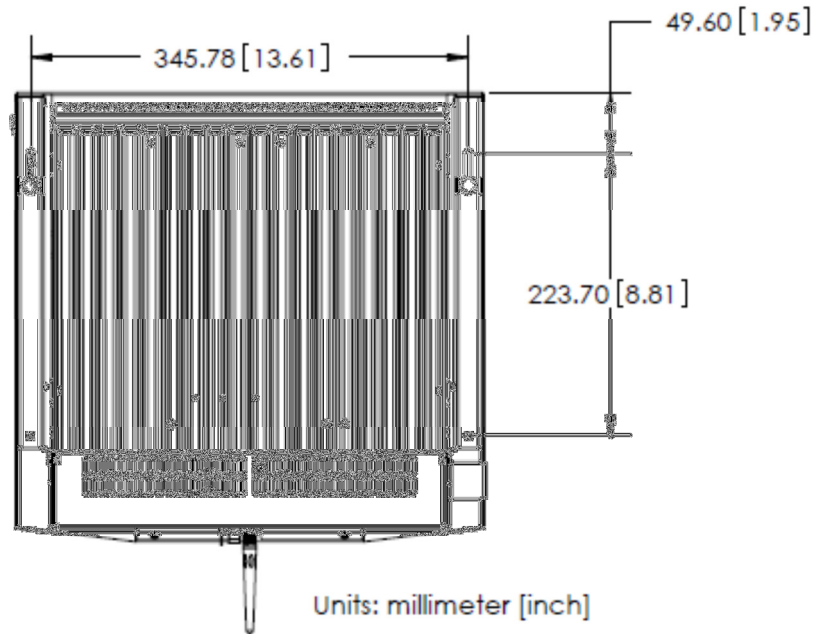


Figure 3 Mounting Hole Diagram

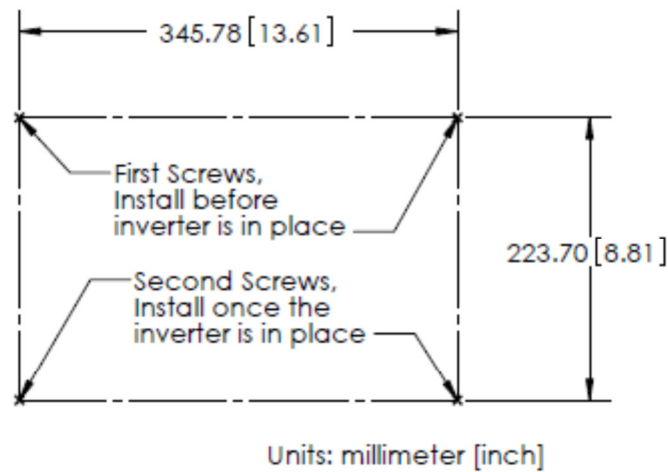


Figure 4 Mounting Screw Diagram

Use the included mounting template to accurately mark and drill holes for installing the X3001. Install two of the included screws into mounting surface 345.8 mm (13.6 in.) apart as shown in Figure 4. Leave a minimum of a 3 mm gap between the head of the screw and the mounting surface to accept the enclosure foot. Install inverter over these two screws. Remove M3 screws securing inverter cover and open cover. Install second two #10 (or equivalent) screws in lower mounting holes. Tighten all screws.

## 6.3 Electrical connection notes

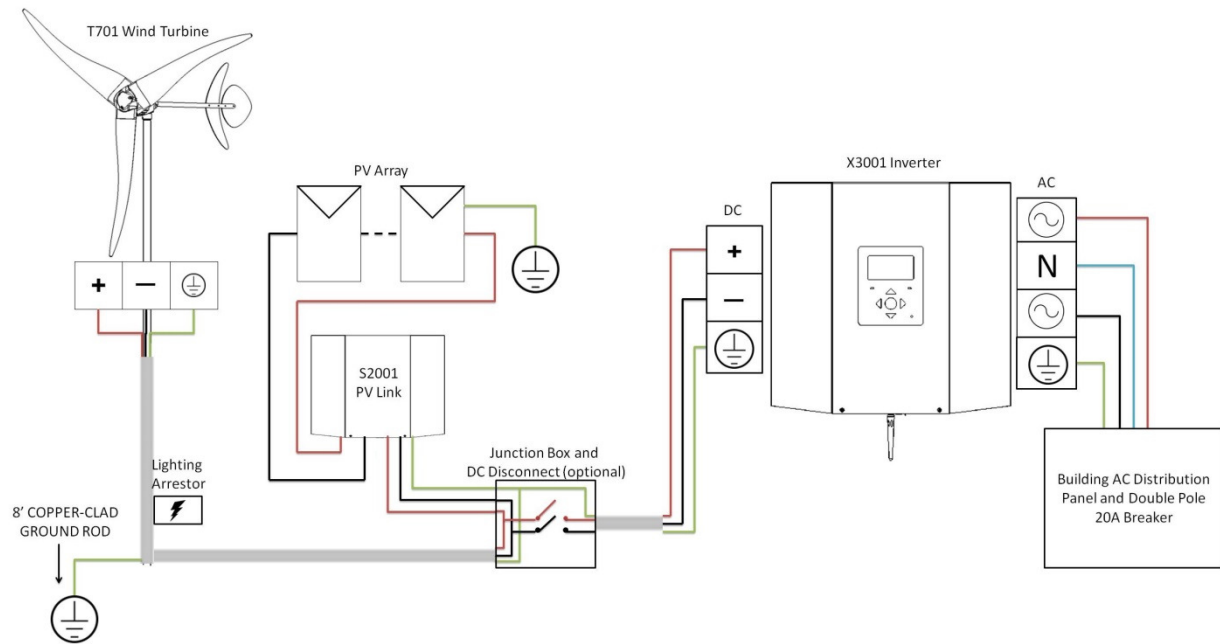


Figure 5 Example X3001 system layout with S2001 PV Link and T701 Wind Turbine



**WARNING:** All electrical installations in the United States shall be done in accordance with all local electrical codes and/or the National Electrical Code (NEC), ANSI/NFPA 70.



**WARNING:** Electrical installation in Canada shall be done in accordance with all local electrical codes and/or the Canadian Electrical Code.



**WARNING:** To reduce the risk of fire, always connect the inverter to a dedicated 15A (or 20A) 2-pole circuit breaker without multiwire branch circuits.

The X3001 Inverter is equipped with concentric electrical knockouts suitable for  $\frac{1}{2}$  or  $\frac{3}{4}$ " conduit fittings. Pika Energy recommends the use of conduit fittings (hubs) which are raintight or wet location hubs that comply with the requirements in the Standard for Fittings for Conduit and Outlet Boxes, UL 514B. AC & DC terminals allow for 14 to 8 AWG copper conductors. Earth ground terminals allow for 14 to 8 AWG copper or aluminum conductors.



## 6.4 AC utility connection



**WARNING:** The wiring of the inverter's AC connections must only be done with the AC distribution panel circuit breaker off.



**WARNING:** Perform a high potential test on all existing wiring before any connections are made! **Never trust existing wiring** until a high potential test has been performed. Pika recommends 1kV testing on all REbus™ wiring. Failure to high potential test existing wiring before installation will void warranty! For questions concerning high potential testing contact Pika Technical Support.

The X3001 is a 240V/60Hz AC grid-connected inverter. Specifically, a split-phase connection with a neutral is required. It cannot be used with a 120 V AC single-phase connection. A dedicated 15 (or 20) amp 2-pole circuit breaker is required for each inverter. An AC service disconnect may be required by local codes or the NEC.

Multiple X3001 units can be used at the same location/facility assuming all codes are followed including NEC, local building codes and area utility guidelines. If multiple units are used, each inverter should have its own dedicated circuit breaker. Contact Pika about configuring the power line communications in applications with adjacent inverters.

For 50Hz applications, contact Pika Energy for a X3001/50Hz product.

## 6.5 REbus™ DC connection



**WARNING:** The wiring of the inverter's REbus™ connections must only be done with the AC distribution panel circuit breaker off and REbus™ sources (e.g. S2001 PV Link, T701 Wind Turbine) either disabled or generation capability removed. Completely cover the surface of all PV arrays with opaque (dark) material, remove string fuses, or use other methods to ensure PV cannot output power to the S2001 PV Link. Lower T701 to ground and secure blades from spinning. Alternatively, disable S2001 PV Link or T701 Wind Turbine using X3001 Inverter interface. Confirm with a meter that the REbus™ Microgrid is below 50 VDC before performing any wiring operations.



**WARNING:** Hazardous voltage is still present on the REbus™ inverter after disconnection of all inputs (AC and DC). Allow 3 minutes for the inverter to discharge the DC voltage completely.



**WARNING:** Perform a high potential test on all existing wiring before any connections are made! **Never trust existing wiring** until a high potential test has been performed. Pika recommends 1kV testing on all REbus™ wiring. Failure to high potential test existing wiring before installation will void warranty! For questions concerning high potential testing contact Pika Technical Support.

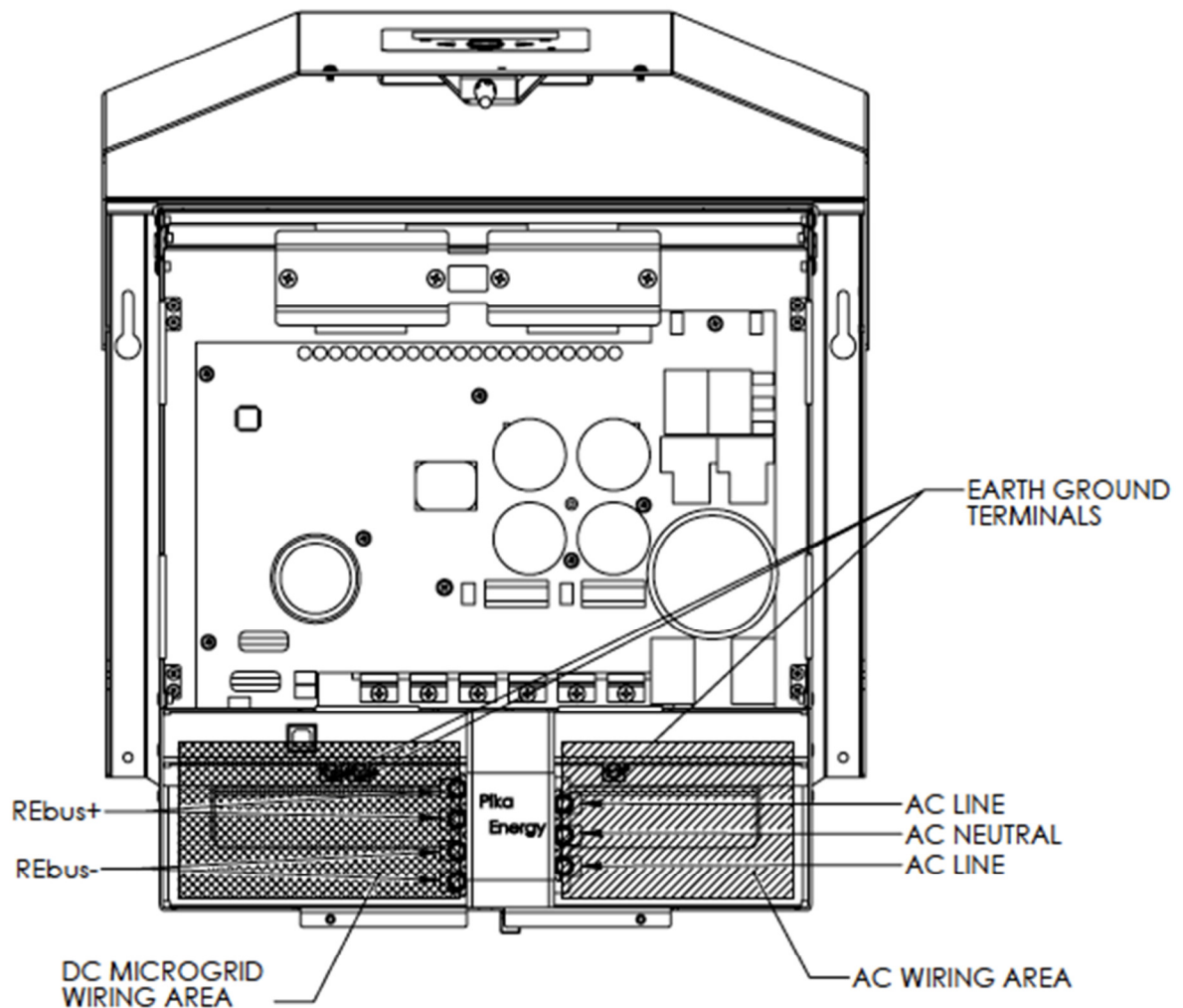



Figure 5 Wiring Diagram

## 6.6 Wiring the inverter

1. Open inverter cover by hinging up, position the kickstand on the right side to catch and support the lid.
2. Remove electrical conduit knockouts, either  $\frac{1}{2}$ " or  $\frac{3}{4}$ ", on the side or bottom surface of inverter. Install electrical conduit.
3. The AC distribution panel circuit breaker should be off and REbus™ sources (e.g. S2001 PV Link, T701 Wind Turbine) either disabled or generation capability removed before any wiring is connected. Completely cover the surface of all PV arrays with opaque (dark) material, remove string fuses, or use other methods to ensure PV cannot output power to the S2001 PV Link.

Lower the T701 to ground and secure blades from spinning. Confirm with a voltmeter that the REbus™ is below 50 VDC before performing any wiring operations.

4. Run wires from AC distribution panel to inverter, connect to terminals (reference Figure 5 for wiring locations), torque to 2.1 Nm (18.5 in-lb)

5.  **WARNING:** Before wiring the DC (REbus™) side of the inverter, ensure all REbus™ wiring in follows the wiring convention described below:

**RE+ :** Red wire (alternatively, white wire marked with at least three continuous wraps of red electrical tape at all terminations, as shown below)

**RE- :** Blue wire (alternatively, black wire marked with at least three continuous wraps of blue electrical tape at all terminations, as shown below)

**Ground:** Green wire (alternatively, bare wire)

6. Run wires from REbus™ DC sources to inverter, connect to terminals (reference Figure 5 for wiring locations), torque to 2.1 Nm (18.5 in-lb). See Figure 6 REbus™ Wiring Color Code for wiring reference.

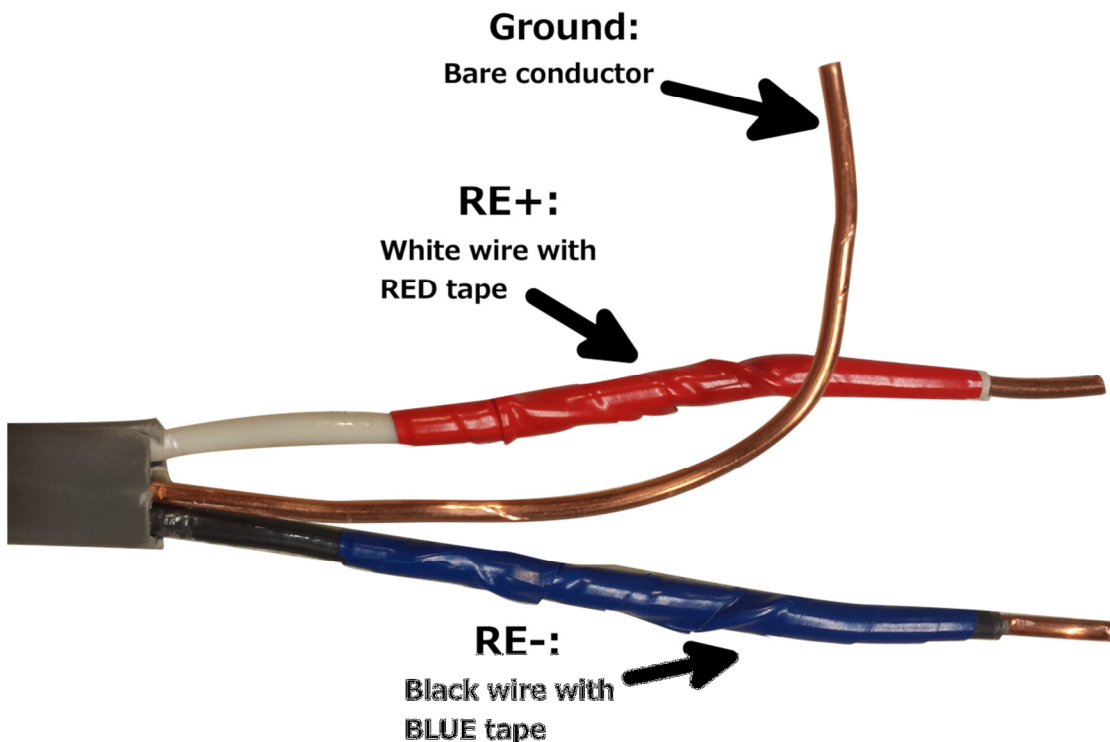


Figure 6 REbus™ Wiring Color Code

7. Connect earth ground wires, torque to as follows:

Wire Size	Screw Torque
8 AWG	4.5 Nm (40 in-lb)
10-14 AWG	4.0 Nm (35 in-lb)



**WARNING:** Make a final check for correctness of all AC and DC wiring to the inverter and in the system. In particular, check that the polarity of the DC wiring is correct throughout the entire system. **Reverse polarity will damage system components**, may create a fire hazard and will void inverter warranty!

8. Close inverter cover and install two cover screws.

## 6.7 Commissioning the inverter

Once the inverter is mounted, and both AC and REbus™ microgrid connections have been made, ensure the inverter enclosure lid is securely attached with its mounting screws. Ensure no wiring is accessible by personnel (install covers on junction boxes, attach shroud on turbine, etc). The inverter is now ready to power ON in accordance with the following steps:

1. Turn on the system DC disconnect (if the system is equipped with optional DC disconnect)
2. Turn on the dedicated 2-pole circuit 240/208VAC circuit breaker on the home/building electrical panel
3. Turn on the system AC disconnect (if the system is equipped with additional AC disconnect)
4. Turn on the power switch on the bottom surface of the inverter.
5. Watch the LCD for initialization sequence.
6. Use the arrow keys to scroll to the inverter page. Enable the inverter by pressing the center button, selecting “Enable” and press “Confirm”. If this is the first time powering up the inverter, devices connected on REbus™ will be automatically discovered.
7. See the X3001 Operation Manual for enabling REbus™ devices, connecting to Wi-Fi and other system configuration.

## 6.8 Operation

Please consult the Pika X3001 User Manual for instruction and important safety precautions related to the operation of your new inverter. Inverter operation is best performed by persons who have read and understand the user manual.

## 7 Troubleshooting

The following table offers a few initial actions to try in the event that the inverter is not functioning as expected. Contact technical service if the symptoms persist.



**WARNING:** Disconnect all AC power and disable sources of DC power before troubleshooting any wiring. Always check wiring with a voltmeter to ensure safe working conditions! Do not open the lid of the inverter without turning off all sources of power connected to it.

Symptom	Action
Unit does not power up	<ol style="list-style-type: none"> <li>1) Check that AC power in the range of 110-130 VAC is present between each of the AC line terminals and ground</li> <li>2) Toggle the power switch on the bottom side of the inverter</li> </ol>
Ground Fault	<ol style="list-style-type: none"> <li>1) Turn off the AC breaker that feeds the inverter. Verify no voltage is present on AC or DC wiring and disconnect the REbus™ (DC) side wiring and ensure it is not touching anything. Power ON the inverter and make sure the ground fault message is no longer displayed.</li> <li>2) Check the wiring on the REbus™ (DC) side. Ensure that none of the DC wires are touching the enclosure or earth ground wires. RE+ and RE- should measure &gt;1MΩ to ground with a multimeter. Some possible scenarios: incorrect REbus™ wiring, lightning arrestor failed, chaffed wire insulation, or broken wire.</li> </ol>
Unit displays waiting state	<ol style="list-style-type: none"> <li>1) Some fault conditions warrant a 5 minute timeout, if the unit does not return to normal operation after 5 minutes contact technical service.</li> </ol>
LCD Screen displays solid black or solid white	<ol style="list-style-type: none"> <li>1) Turn the unit off using the power switch on the bottom, wait 1 minute and turn it back on again.</li> </ol>
Inverter display does not show connected REbus™ devices OR connected devices have status “offline” although the inverter is operating.	<ol style="list-style-type: none"> <li>1) Check that ground wire on REbus™ side is connected to the lug in the wiring compartment. There must be a continuous ground wire from the X3001 to the device for communications to work properly.</li> <li>2) Reseat the cable that attaches the LCD screen to the main board within the X3001. Note this is a polarized connector. It may be dislodged during shipping or installation.</li> <li>3) Call technical support for further troubleshooting.</li> </ol>
Inverter shows devices that are no longer connected to REbus™	<ol style="list-style-type: none"> <li>1) Delete unwanted devices by selecting “Remove” under the device page. Reference X3001 Operations Manual for further detail.</li> </ol>



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